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(56) Documents Cited

US 4713042 A

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UK CL (Edition P ) F2D DRC

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Online: WPI

(54) Abstract Title

**Light automatic transmission for bicycles**

(57) A light automatic transmission for bikes, with hinged arms 2 around the central hub 3 of the rear wheel that swing depending the speed, and moving sprocket 4 laterally in order to change the position of the chain 5 on the gear block 4.

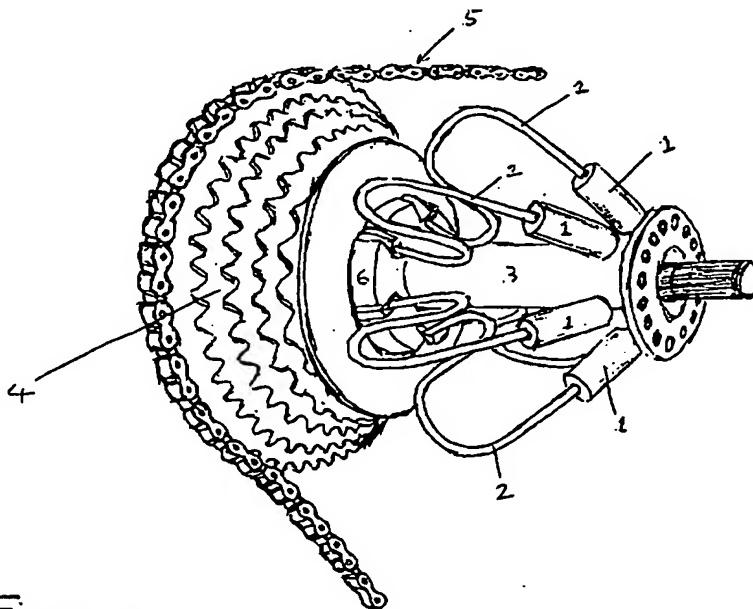


Figure 3

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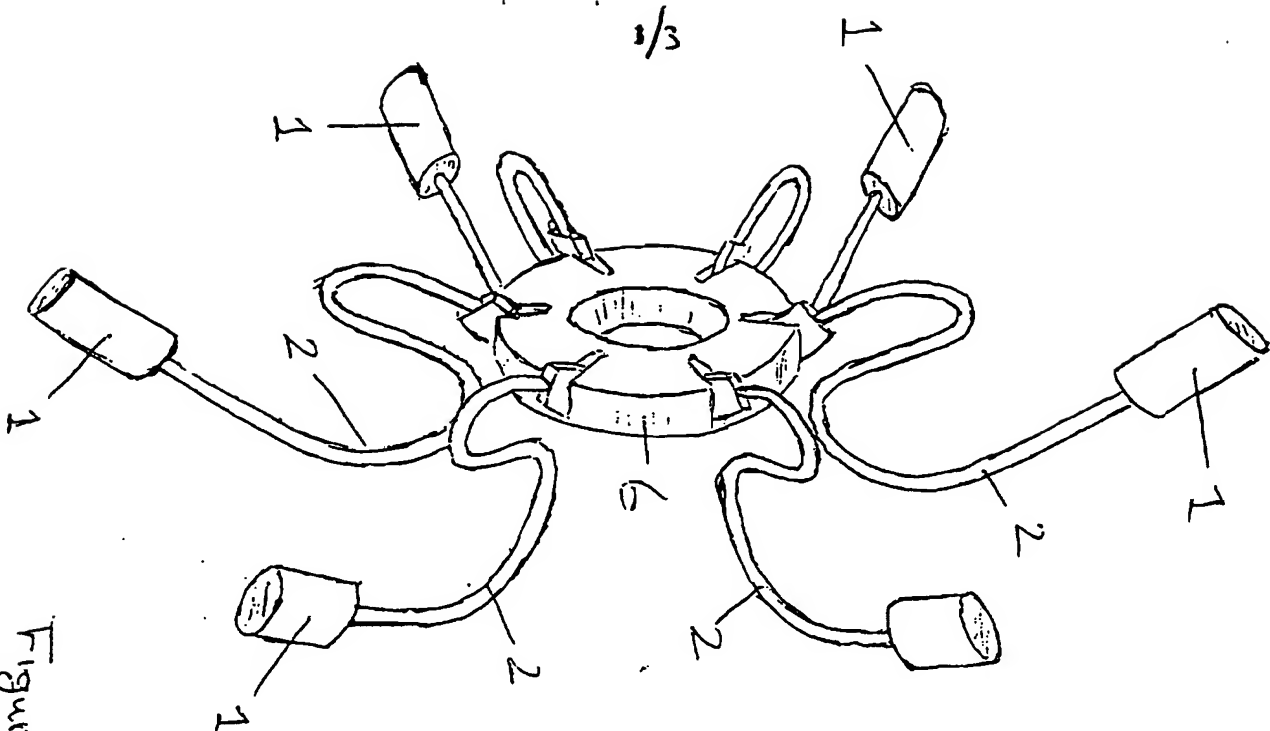


Figure 2

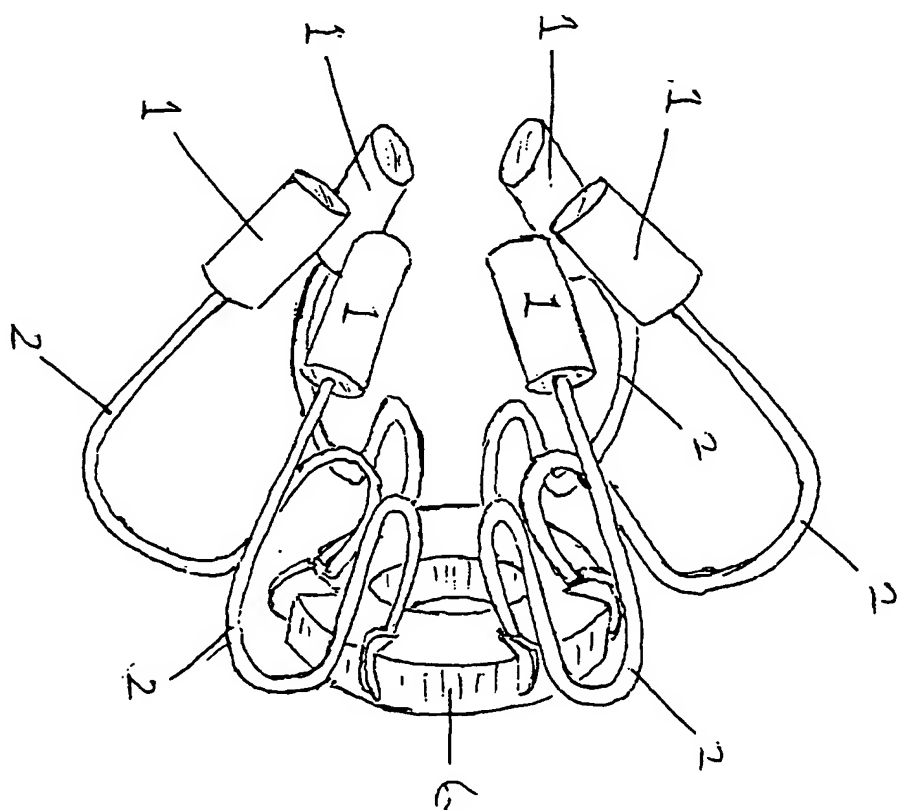
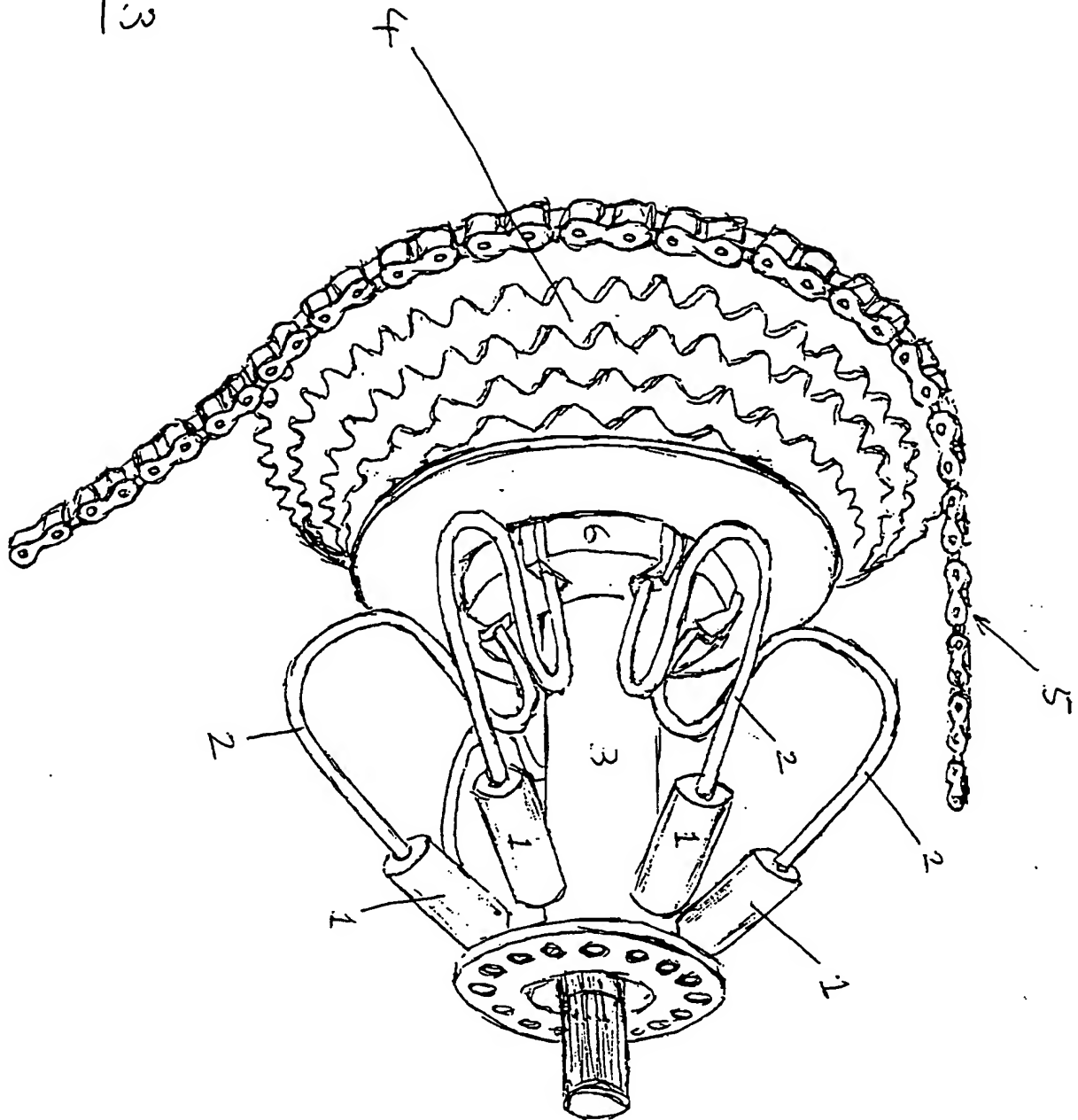


Figure 1

Figure 3

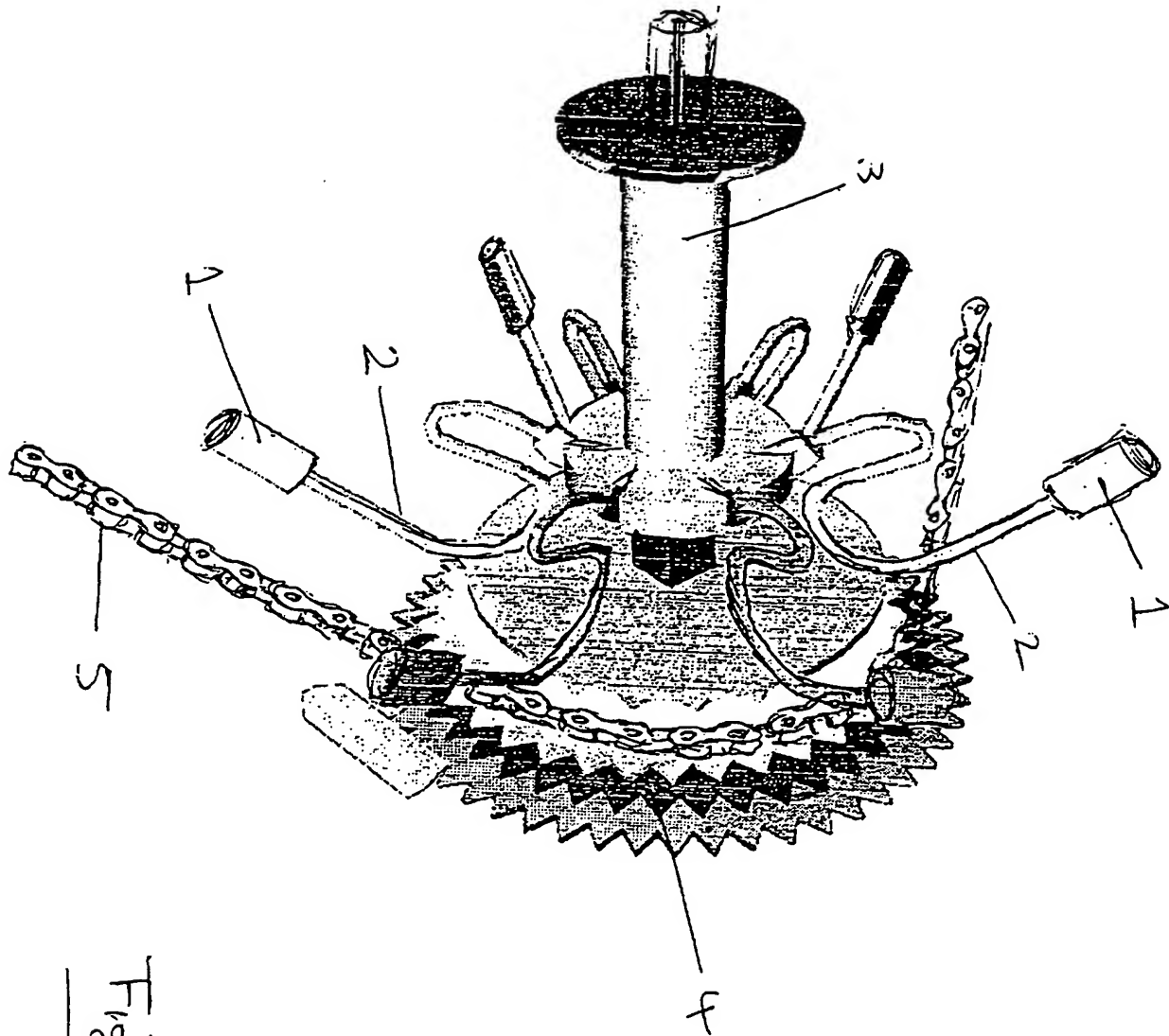


Figure 4.

## **Light Automatic Transmission for Bicycles**

The invention is an automatic gear changer for mountain and racing bicycles, and it changes the gears where they need to be changed depending on the speed of the bicycle.

In the ordinary types of bicycle (those with manual gear shifter) and in a non-race rides the gears should be changed in regard to the speed of the bike, steep of the road and also at the road bends.

In professional races these changes are critical and can effect the result of the race, and in non-competing rides changing in to the wrong gear can cause tiredness. In one experimented case of going downhill while peddling fast and changing the gear from a heavy gear into the light gear causes loss of control, which might result in accident.

The light automatic transmission, helps the rider in changing the gears and the rider does not need to change them manually. This allows the rider to have a better concentration on the road traffic as well as increasing the efficiency and comfortability of the ride.

And as the device designed to be light, installing it on a bicycle reduces the overall weight of the bike which is another advantage.

### **How it works?**

The system works on the basis of centrifugal force and there are six arms around the rear hub, they drive away from the hub by their heavy ends and they push the gears block laterally and because the chain can not move side to side it will be driven on to the next gear regarding the speed of the bicycle.

This is vital to mention that, the big difference between this device and ordinary gear shifters is that instead of moving the chain by the drailliure, the gear block moves by the cam-like part of the six arms.

**Figure 1:**

There are six arms 2 around the hub 3 , they are hinged to the arm holder 6 and they can swing by their heavy ends 1.

**Figure 2:**

As the bike speeds up the centrifugal force makes the arms 2 to swing away from the hub 3 and as they swing they all together push the gear block 4 to move on its axis.

**Figure 3:**

Shows the whole device in the rest position, and the chain 5 is on the larger gear which is the lightest gear and the one we need to have a smooth start.

**Figure 4:**

Theoretically shows the device in speed, and the arms 2 have pushed the gear block 4, and the chain 5 would be on the smallest gear which is suitable for that speed.

The gear block also engages the other gears with the chain depending the speed of the bike which varies in accordance with the road conditions and the riders decision makings.

## CLAIMS

1. An automatic gear changer which works on the basis of centrifugal force and changes the gears by moving the gear block (Sprocket)4, using hinged components to push the sprocket 4 instead of moving the chain 5.



The  
Patent  
Office

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Application No: GB 9817850.2  
Claims searched: 1

Examiner: Tom Sutherland  
Date of search: 7 September 1998

**Patents Act 1977**  
**Search Report under Section 17**

**Databases searched:**

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:  
UK CI (Ed.P): F2D (DRC)  
Int CI (Ed.6): B62M 9/10, 9/14, 25/00  
Other: Online: WPI

**Documents considered to be relevant:**

Category	Identity of document and relevant passage	Relevant to claims
X	US 4713042 (IMHOFF) See Figs 1 and 2 and column 8 line 58 to column 9 line 5.	1

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.